

Past, Present, and Possible Future Human Infection with Influenza Virus A Subtype H7

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CME ACTIVITY

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Learning Objectives

Upon completion of this activity, participants will be able to:

- Describe the transmission mechanism and attack rate for the H7 strain of influenza virus in humans
- Describe clinical manifestations of H7 virus infection in humans
- Identify reasons for increased prevalence of human infection with the H7 virus in future
- Describe differences in clinical presentation of infection with H5N1 and H7 viruses
- Identify the best strategy for protection against avian virus infection for humans

Editor

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Influenza A subtype H7 viruses have resulted in >100 cases of human infection since 2002 in the Netherlands, Italy, Canada, the United States, and the United Kingdom. Clinical illness from subtype H7 infection ranges from conjunctivitis to mild upper respiratory illness to pneumonia. Although subtype H7 infections have resulted in a smaller proportion of hospitalizations and deaths in humans than those caused by subtype H5N1, some subtype H7 strains appear more adapted for human infection on the basis of their virus-binding properties and illness rates among exposed persons. Moreover, increased isolation of subtype H7 influenza viruses from poultry and the ability of this subtype to cause severe human disease underscore the need for continued surveillance and characterization of these viruses. We review the history of

human infection caused by subtype H7. In addition, we discuss recently identified molecular correlates of subtype H7 virus pathogenesis and assess current measures to prevent future subtype H7 virus infection.

Influenza A viruses belong to the family *Orthomyxoviridae* and possess 8 negative-sense RNA segments encoding 11 known proteins. Of these, the 2 viral surface glycoproteins, hemagglutinin (HA) and neuraminidase (NA), form the basis of multiple serologically distinct virus subtypes. Currently, 16 HA and 9 NA subtypes have been identified in wild water birds, the natural host for all influenza A viruses and the reservoir from which viruses emerge to infect domestic poultry and occasionally mammals. Most influenza viruses that infect wild or domestic birds cause no or limited illnesses and deaths and are characterized as being low pathogenicity avian influenza (LPAI) viruses. However, viruses within the H5 and H7 subtypes have the capacity to acquire genetic properties that confer high virulence and a

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Article Title

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CME Questions

1. Which of the following best describes the anticipated attack rate of a pandemic influenza virus on the basis of attack rates in past pandemics?

- A. 10% to 15%
- B. 25% to 35%
- C. 40% to 50%
- D. 55% to 65%

2. Which of the following is least likely to be an early clinical manifestation of H7 influenza virus?

- A. Pneumonia
- B. Conjunctivitis
- C. Coryza
- D. Encephalitis

3. Which of the following is the most likely reason for expectations of future human infection with the H7 avian influenza virus?

- A. Increased detection in nonpoultry farm animals
- B. Increased frequency of human and poultry infection
- C. Increased detection of human infection in the African continent
- D. All of the above

4. Which of the following best describes the difference between infection with H5N1 and H7 subtypes of the avian influenza virus in humans?

- A. H5N1 manifests most frequently as neurologic disease
- B. H7 most frequently manifests as conjunctival disease
- C. H7 manifests only rarely as respiratory disease
- D. The 2 infections are indistinguishable clinically

5. Which of the following strategies is considered the best protection of humans against avian influenza viruses?

- A. Antiviral agents
- B. Quarantine and slaughter of infected poultry
- C. Vaccination of humans
- D. Handwashing hygiene measures

Activity Evaluation

1. The activity supported the learning objectives.

Strongly Disagree

1

2

3

4

Strongly Agree

5

2. The material was organized clearly for learning to occur.

Strongly Disagree

1

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Strongly Agree

5

3. The content learned from this activity will impact my practice.

Strongly Disagree

1

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Strongly Agree

5

4. The activity was presented objectively and free of commercial bias.

Strongly Disagree

1

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Strongly Agree

5